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USSR AGRICULTURAL CLIMATOLOGY

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A. I. Voyeykov and P. I. Brounov were the founders of agricultural climatology in the USSR. Brounov developed Voyeykov's early studies on the dependence of plant growth and productivity upon weather, and thus laid the foundation for objective, accurate, and differential agroclimatic forecasts. Unfortunately, the network of agrometeorological stations organized by him did not produce the results expected, because the problem was very complex and difficult. Nevertheless, Brounov is credited with the first attempts to produce an agroclimatic regional division of the European SSR, and to develop the climatic characteristics of droughts in their agronomic concept (probability of drought decades). However, he did not connect this study with the concept of "critical periods" in the life of plants, which concept had been established in the 1900's by the Bureau of Agricultural Meteorology in the Ministry of Agriculture, and therefore this study was not used in practice. The Bureau of Meteorology trained agrometeorologists who continued the Bureau's work after Brounov's death.

The Amur meteorological Bureau of the Immigration Administration used climatological characteristics for agricultural purposes in a more practical way than did Brounov, but these studies, for purely accidental reasons, did not obtain further development.

The work of Brounov's Meteorological Bureau was widely known and imitated abroad before the Revolution.

Actually, however, studies in the field of agricultural climatology were established on a firm basis and obtained a permanent expanding market only after the organization of a planned socialistic economy in the USSR. In 1924, a state network of agrometeorological stations was organized to replace Voyeykov and Brounov's amateur stations, and the study of climate in order to plan agricultural production became one of the basic problems of experimental institutions. Brounov's Bureau of Meteorology, which was reorganized in 1932 into the Agrohydrometeorological Institute (before the war, the Agrohydrometeorological Institute was transferred to the All-Union Institute of Plant Studies (VIR) as a division of the latter), along with the Agrometeorology Division of the Saratov

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Experimental Station and several other experimental institutions, set up extensive study programs on agricultural climatology. These studies closely connected the study of climate with soil hydrology, agricultural geography, and the behavior and productivity of cultivated plants.

The practical demands of planning organizations directed the studies along a definite path, and stimulated the development of methods of agricultural evaluation of the climate in order to obtain rapid and practical solutions to problems of possible relocation of crops areas and plant types, as well as problems connected with agrotechnical methods.

In the process of satisfying the individual demands of production, the various stations utilized observations of numerous "sort sections," experimental fields, and agrometeorological works and made special meteorological observations with definite objectives.

The most highly organized and comprehensive survey was conducted to determine the possible distribution according to climatic conditions of many subtropical plants into Transcaucasia, of vegetable crops into Artic regions and the Urals, of grapes throughout the USSR, and to determine the season limits for sowing most field crops for the greater part of the USSR. On the basis of a study of the snow cover and water resources of soil in connection with the climate, the theory and practice of improving snow-covered soils was developed, and the water supply for the main field crops was calculated for most of the USSR.

Practical results of the studies were: a method of agroclimatic indexes was developed which connects the biological properties of cultivated plants with the state of the physical medium surrounding them with respect to microclimate; a number of preparatory agroclimatic maps for the entire USSR were drafted; the World Agroclimatic Handbook was published (1937); a world agroclimatic atlas was made ready for publication (1939); and special equipment for microclimatological and phytoclimatological studies was devised. This work was done by the Agrohydrometeorological Institute.

At present, the Agrometeorology Division, All-Union Institute of Plant Studies, is completing the classification of cultivated plants with respect to their climatic requirements, and has begun a climatic regional division of the USSR based upon the synthesis of genetic and production climatic characteristics.

In the latter work, the territory of the USSR is divided into seven large climatic regions, classified according to their genetic characteristics with consideration for the degree of possible agricultural utilization of the territory, and 36 climatic provinces are set out according to each region's type of continental climate. Each province is further divided into zones from a more detailed consideration of the heat supply for the vegetation period (to facilitate selection of crops and sorts), and finally, details on microclimatic variations are provided for each zone as required. Guided by these detailed agroclimatic maps, organization plans were drawn up for citrus and tea sovkhozes in Georgia and for the farms of immigrants settling on the lands of the Greater Amur main line.

In conclusion, we note that the concept of complex characteristics of climate with respect to the frequency of weather types was developed in the USSR and used for agricultural purposes, and recently an attempt has been made to link the frequency of weather types with air masses and synoptic processes (Chubukov).

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